



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/036,809	12/31/2001	Ge Nong	01-HK-048 (STMI01-01048)	5323
7590 Lisa K. Jorgenson STMicroelectronics, Inc. 1310 Electronics Drive Carrollton, TX 75006				
EXAMINER				
MURPHY, RHONDA L				
ART UNIT		PAPER NUMBER		
2462				
MAIL DATE		DELIVERY MODE		
02/01/2011		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/036,809

Applicant(s)

NONG, GE

Examiner

RHONDA MURPHY

Art Unit

2462

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 August 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 January 2010 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-940)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/19/10 has been entered.
2. Accordingly, claims 1-20 are currently pending.

Response to Arguments

3. Applicant's arguments with respect to claims 1, 4, 7 and 14 have been considered but are moot in view of the new ground(s) of rejection.
4. In response to the arguments that claim 1 has been amended to include the elements of Figure 4, it is noted that claims 1, 4, 7 and 14 have not been amended to included subject matter of Figure 4, blocks 405 to 435, as discussed in interviews with the applicant's representative.

Claim Objections

5. Claims 1, 7 and 14 are objected to because of the following informalities:
6. In claim 1, line 3, "buffers" should be replaced with "buffer".
7. In claim 1, line 4, "packets" should be replaced with "packet".

8. In claim 1, line 7, "input" should be replaced with "N input".
9. In claim 1, line 10, "buffers" should be replaced with "buffer".
10. In claim 1, line 12, "buffers" should be replaced with "buffer".
11. In claim 1, line 14, "at least one incoming data" should be replaced with "at least one incoming fixed data".
12. In claim 1, line 14, "and one incoming" should be replaced with "and one outgoing".
13. In claim 7, line 15, "the input" should be replaced with "an input".
14. In claim 14, line 17, "the input" should be replaced with "an input".
15. Appropriate correction is required.

Claim Rejections - 35 USC § 112

16. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
17. Claim 1, 7 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
18. In claim 1, line 2, it is unclear how the switch fabric comprises "an input scheduler". Figure 2 and 3 do not illustrate the switch fabric comprising "an input scheduler".
19. In claim 1, lines 3, 8 and 10, "simulated switch" is unclear and Examiner questions whether the "simulated switch" is intended to represent the switch fabric.

20. In claim 1, 2nd to last line, "matched head of line cell" is unclear.
21. In claim 1, last line, "repeats the configuration of the emulated crossbar" is unclear.
22. In claim 7, last line, "repeats the configuration of the crossbar" is unclear.
23. In claim 7, 2nd to last line, "matched head of line cell" is unclear.
24. In claim 14, 2nd to last line, "matched head of line cell" is unclear.
25. In claim 14, last line, "repeats the configuration of the emulated crossbar" is unclear.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1- 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krishna et al. (US 6,563,837).

Regarding claim 1, Krishna teaches a network device (Fig. 1; device 49) comprising: an input scheduler that receives at least one incoming fixed data packet to be forwarded into a simulated switch (col. 7, lines 5-10) to at least one N input buffers (queues 56, 57, 58), wherein the N input buffer is configured to receive at least one incoming fixed data packet at a first data rate (col. 8, lines 34-35) and further configured to output said at least one incoming fixed data packet at a second data rate (col. 8, lines 34-38), wherein

the second data rate is at least twice the first data rate (col. 8, lines 37-38) and is selected to promote an emulated buffered crossbar (col. 7, line 57 to col. 8, line 4), and wherein the queuing of the input buffer is performed through a virtual output queue in the simulated switch where the incoming fixed data packets queued according to their destination port (col. 7, line 57 to col. 8, line 4);

an output scheduler that receives at least one outgoing fixed data packet to be forwarded out of the simulated switch (col. 7, lines 49-53, 66-67 to col. 8, lines 1-2) to at least one N output buffers, (queues 65) wherein the N output buffer is configured to N output buffers configured to receive fixed-size data packets at said second data rate (col. 8, lines 10-15, 34-38) and configured to output said fixed-sized data packets to an output port (62) at said first data rate (col. 9, lines 6-9), wherein said N output buffers are internal to said switch fabric (see Fig. 1) and are external to said output port (see Fig. 1); wherein the input and output scheduler schedule the at least one incoming data packet and one incoming fixed data packet once per timeslot (col. 7, lines 66 to col. 8, line 2 and 34-37);

and a bufferless, non-blocking interconnecting network (Fig. 1, col. 3, lines 63-65; col. 6, lines 60-61; channels 80 – 88 form crossbar 89, which does not include any buffers) configured to receive from said N input buffers said fixed-size data packets at said second data rate and configured to transfer said fixed-size data packets to said N output buffers at said second data rate (col. 8, lines 10-15, 34-38) and

a scheduling controller (arbiter 90) connected to the bufferless, non-blocking interconnecting network (see Fig. 1; col. 1, lines 22-30; further described in col. 5, lines

8-13), wherein the scheduling controller is configured to determine a maximal configuration of the bufferless, non-blocking interconnecting network (col. 8, lines 5-10, 16-22) and emulated crossbar based upon the data in the N input buffers (col. 7, line 57 to col. 8, line 4) and controls the configuration of the bufferless, non-blocking interconnecting network through communications with the bufferless, non-blocking interconnecting network (col. 1, lines 22-30; further described in col. 8, lines 34-38), and wherein the scheduling controller further promotes a transmitting of a matched head of line cell at each virtual output queue and repeats the configuration of the emulated crossbar twice per timeslot (col. 7, lines 49-53, 66-67 to col. 8, lines 1-15, 37-38).

Krishna fails to explicitly call the network device 49 a switch. However, the network device, which includes the fabric to switch data packets, functions as a switch.

Therefore, it would have been obvious to one skilled in the art to use Krishna's network device as a switch for switching the data packets through the network.

Regarding claims 2 and 5, Krishna teaches a bufferless, non-blocking interconnecting network, comprising a bufferless crossbar (Fig. 1, col. 3, lines 63-65; col. 6, lines 60-61; channels 80 – 88 form crossbar 89, which does not include any buffers).

Regarding claims 3 and 6, Krishna teaches each of said N input buffers is at least twice the size of each of said N output buffers (see Fig. 1).

Regarding claim 4, Krishna teaches the same limitations described above in the rejection of claim 1. Krishna further teaches wherein control of delay, jitter, throughput, and ordering of packets through the switch is controlled by the controller adjusting the

emulated crossbar and through a virtual output queue (col. 1, lines 56-58; co. 7, lines 57-65; col. 8, lines 1-19; col. 15, lines 14-15).

Regarding claims 7 and 14, Krishna teaches a plurality of fixed-size data packet switches (all elements of Fig. 1, col. 7, lines 35-36), at least one of said fixed-size data packet switches comprising:

N input ports (Fig. 1; ports 53, 54, 55) configured to receive incoming fixed-size data packets at a first data rate and to output said fixed-size data packets at said first data rate (col. 8, lines 34-38);

N output ports (ports 62, 63, 64) configured to receive fixed-size data packets at said first data rate (col. 8, lines 10-15) and to output said fixed-sized data packets at said first data rate (col. 9, lines 6-9); and

a network device (device 49; col. 6, lines 60-61) interconnecting said N input ports and said N output ports (see Fig. 1) comprising:

N input buffers (queues 56, 57, 58) configured to receive incoming fixed-size data packets at a first data rate and to output said fixed-size data packets at a second data rate equal to at least twice said first data rate (col. 8, lines 34-38), wherein said N input buffers are internal to said network device (see Fig. 1) and are external to said N input ports (see Fig. 1) and are configured to queue the fixed-size data packets through a virtual output queue according to their destination port (col. 7, line 57 to col. 8, line 4);

N output buffers (queues 65) configured to receive fixed-size data packets at said second data rate (col. 8, lines 10-15, 34-38) and to output said fixed-sized

data packets at said first data rate (col. 9, lines 6-9) wherein said N output buffers are internal to said switch fabric (see Fig. 1) and are external to said N output ports (see Fig. 1); wherein the input and output scheduler schedule the at least one incoming data packet and one incoming fixed data packet once per timeslot (col. 7, lines 66 to col. 8, line 2 and 34-37);

a bufferless, non-blocking interconnecting network (Fig. 1, col. 3, lines 63-65; col. 6, lines 60-61; channels 80 – 88 form crossbar 89, which does not include any buffers) configured to receive from said N input buffers said fixed-size data packets at said second data rate and to transfer said fixed-size data packets to said N output buffers at said second data rate (col. 8, lines 10-15, 34-38); and

a scheduling controller (arbiter 90) connected to the bufferless, non-blocking interconnecting network (see Fig. 1; col. 1, lines 22-30; further described in col. 5, lines 8-13), wherein the scheduling controller is configured to emulate a crossbar within the bufferless, non-blocking interconnecting network (col. 7, line 57 to col. 8, line 4) and to determine a maximal configuration of the bufferless, non-blocking interconnecting network based upon the data in the N input buffers (col. 8, lines 5-10, 16-22) and controls the configuration of the bufferless, non-blocking interconnecting network (col. 1, lines 22-30; further described in col. 8, lines 34-38) and wherein the scheduling controller further promotes a transmitting of a matched head of line cell at each virtual output queue and repeats the

configuration of the crossbar twice per timeslot (col. 7, lines 49-53, 66-67 to col. 8, lines 1-15, 37-38).

Krishna fails to explicitly call the network device 49 a switch. However, the network device, which includes the fabric to switch data packets, functions as a switch.

Therefore, it would have been obvious to one skilled in the art to use Krishna's network device as a switch for switching the data packets through the network.

Regarding claims 8 and 15, Krishna teaches a bufferless, non-blocking interconnecting network comprising a bufferless crossbar (Fig. 1, col. 3, lines 63-65; col. 6, lines 60-61; channels 80 – 88 form crossbar 89, which does not include any buffers).

Regarding claims 9 and 16, Krishna teaches each of said N input buffers is at least twice the size of each of said N output buffers (see Fig. 1).

Regarding claims 10 and 17, Krishna teaches a scheduling controller is configured to schedule transfer of said fixed-size data packets from said N input ports to said switch fabric (arbiter 90; col. 8, lines 24-38).

Regarding claims 11 and 18, Krishna teaches a scheduling controller is configured to schedule the transfer of said fixed-size data packets from said N output ports to an external device (col. 8, lines 5-15; 24-38).

Regarding claims 12 and 19, Krishna teaches a scheduling controller is configured to schedule the transfer of said fixed-size data packets from said N input buffers to said bufferless, non-blocking interconnecting network (col. 8, lines 5-15; 24-38).

Regarding claims 13 and 20, Krishna teaches a scheduling controller is configured to schedule the transfer of said fixed-size data packets from said N output buffers to said N output ports (col. 8, lines 5-15; 24-38).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RHONDA MURPHY whose telephone number is (571)272-3185. The examiner can normally be reached on Monday - Friday 9:00 - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on (571) 272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Rhonda Murphy

Examiner
Art Unit 2462

/R. M./
Examiner, Art Unit 2462

/Kevin C. Harper/
Primary Examiner, Art Unit 2462